

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



U. S. Department of Energy

National Energy Technology Laboratory

**Carbon Dioxide Capture And Separation Technology
Development For Application To Existing
Pulverized Coal-Fired Power Plants**

Funding Opportunity Number: DE-PS26-08NT00134

Announcement Type: Initial

CFDA Number: 81.089 Fossil Energy Research and Development

Issue Date:	February 13, 2008
Letter of Intent Due Date:	Not Applicable
Pre-Application Due Date:	Not Applicable
Application Due Date:	March 20, 2008 at 8:00:00 PM Eastern Time

NOTE: NEW REQUIREMENTS FOR GRANTS.GOV

Where to Submit

Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

Registration Requirements

There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

Microsoft Vista and Office 2007 Compatibility

Grants.gov is currently incompatible with both the new Microsoft (MS) Vista Operating System and the new Microsoft (MS) Office 2007 versions of Word, Excel, and Power Point. In order to create and submit your application to Grants.gov, you must find a computer with a previous version Microsoft Operating System, such as Windows XP.

If you attach a file created using MS Office 2007, you will not get an error message when you submit the application, HOWEVER, your entire application will not be able to be processed or accepted at Grants.gov and will not reach DOE. Grants.gov can accept applications with attachments created in MS Office 2007 if the attachments are saved in the prior format. See the http://www.grants.gov/assets/Vista_and_office_07_Compatibility.pdf for detailed instructions on how to do this. A file created in MS Office 2007 can be identified by the "x" at the end of the file extension, for example "sample.docx" for a Word file. Contact Grants.gov at 1-800-518-4726 with any questions.

Questions

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of this announcement explains how to submit other questions to the U.S. Department of Energy (DOE).

Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. When the AOR receives e-mail Number 5, it is their responsibility to follow the instructions in the e-mail to logon to IIPS and verify that their application was received by DOE. The titles of the five e-mails are:

Number 1 – Grants.gov Submission Receipt Number
Number 2 – Grants.gov Submission Validation Receipt for Application Number
Number 3 – Grants.gov Grantor Agency Retrieval Receipt for Application Number
Number 4 – Grants.gov Agency Tracking Number Assignment for Application Number
Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

TABLE OF CONTENTS

PART I – FUNDING OPPORTUNITY DESCRIPTION	5
PART II – AWARD INFORMATION	11
A. TYPE OF AWARD INSTRUMENT	11
B. ESTIMATED FUNDING	11
C. MAXIMUM AND MINIMUM AWARD SIZE	11
D. EXPECTED NUMBER OF AWARDS	11
E. ANTICIPATED AWARD SIZE	11
F. PERIOD OF PERFORMANCE	11
G. TYPE OF APPLICATION	11
PART III - ELIGIBILITY INFORMATION	12
A. ELIGIBLE APPLICANTS	12
B. COST SHARING	12
C. OTHER ELIGIBILITY REQUIREMENTS	12
PART IV – APPLICATION AND SUBMISSION INFORMATION	14
A. ADDRESS TO REQUEST APPLICATION PACKAGE	14
B. LETTER OF INTENT AND PRE-APPLICATION	14
C. CONTENT AND FORM OF APPLICATION – 424 (R&R)	14
D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS	22
E. SUBMISSION DATES AND TIMES	22
F. INTERGOVERNMENTAL REVIEW	22
G. FUNDING RESTRICTIONS	22
H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS	23
PART V - APPLICATION REVIEW INFORMATION	24
A. CRITERIA	24
B. REVIEW AND SELECTION PROCESS	25
C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES	25
PART VI - AWARD ADMINISTRATION INFORMATION	26
A. AWARD NOTICES	26
B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS	26
C. REPORTING	27
PART VII - QUESTIONS/AGENCY CONTACTS	29
A. QUESTIONS	29
B. AGENCY CONTACT	29
PART VIII - OTHER INFORMATION	30
A. MODIFICATIONS	30
B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE	30
C. COMMITMENT OF PUBLIC FUNDS	30
D. PROPRIETARY APPLICATION INFORMATION	30
E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL	30
F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM	31
G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER	31
H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES	31

PART I – FUNDING OPPORTUNITY DESCRIPTION

BACKGROUND

Coal-fired utility boilers generate over 50% of the electricity in the United States, and DOE's Energy Information Agency (EIA) projects that the more than 300 GW of coal-fired electricity generating capacity currently in operation will increase to nearly 450 GW by 2030.¹ Therefore, for the foreseeable future coal will continue to play a critical role in powering the Nation's electricity generation, especially for base-load power plants.

Coal-fired power plants have made significant progress in reducing emissions of sulfur dioxide (SO₂), nitrogen oxide, particulate matter, and now mercury, since the passage of the Clean Air Act. However, looming on the near horizon is the possibility for regulations requiring a reduction in carbon dioxide (CO₂) emissions. Greenhouse gases such as CO₂ have increased over the past century and have been linked to increasing global temperatures. The amount of CO₂ produced from the combustion of fossil fuels in the United States will have reached nearly 6 billion metric tons in 2007 according to EIA, with about 33% from the coal-fired electric power sector.²

In order to address these issues, the Department of Energy's Carbon Sequestration Program has been investigating technologies to capture and sequester CO₂ emissions from coal-fired power plants. The details of the program objectives, projects, and status can be found through the National Energy Technology Center's Carbon Sequestration website and the Carbon Sequestration Program Roadmap.

Website: http://www.netl.doe.gov/technologies/carbon_seq/index.html

Roadmap:

http://www.netl.doe.gov/technologies/carbon_seq/refshelf/project%20portfolio/2007/2007Roadmap.pdf

OBJECTIVES

This funding opportunity announcement is specifically focused on developing technologies for CO₂ capture and separation that can be retrofitted to existing pulverized coal (PC) power plants. This is driven by the fact that existing coal-fired power plants produce a sizeable portion of current CO₂ emissions from all fossil-fuel-based sources, and that only about 6 GW of the existing coal-fired electricity generating fleet is projected to retire by 2030². Therefore, it is possible that future climate change regulations could target a reduction in CO₂ emissions from the existing fleet of coal boilers. Also, at this time there are not cost effective technologies available for capturing CO₂ from PC-based power plants. It is anticipated that the technologies sought under this funding opportunity would also have application to new PC plants as well.

Applications are sought for laboratory, bench-scale, and pilot-scale research and development (R&D) of advanced CO₂ capture technologies. The overall technical and cost goal of this funding opportunity is the development of advanced CO₂ capture and separation technologies that can achieve at least 90% CO₂ removal (captured CO₂ must represent at least 90% of the carbon in the fuel fed to the power plant) at no more than a 20% increase in cost of energy services. The cost component includes not only the costs associated with CO₂ capture, regeneration, and compression, but also CO₂ transportation, storage, and monitoring costs. It should be assumed that the CO₂ will be transported no more than 50 miles from

¹ Annual Energy Outlook 2007, Report #:DOE/EIA-0383(2007)

² Annual Energy Outlook 2007, Report #:DOE/EIA-0383(2007)

the power plant and would be stored in a saline formation. In a typical CO₂ capture system analysis, the transportation, storage and monitoring costs represent about 4% of the increase in cost of energy services. Therefore, applicants must factor in these costs in demonstrating that their proposed technology can achieve the 20% or less increase in cost of energy services goal.

Carbon dioxide capture systems can be divided into three general categories: post-combustion, pre-combustion, and oxy-combustion (including chemical looping). Since this funding opportunity is focusing on PC-fired power plants, only proposals in the areas of post-combustion and oxy-combustion CO₂ capture are sought. Pre-combustion CO₂ capture systems are **not** sought under this announcement. All applications must include a block flow diagram that shows how the proposed capture concept will be integrated into a pulverized coal power plant. Specifically, applications are sought in the following Areas of Interest:

Post-Combustion Capture

- Area of Interest 1: Membranes
- Area of Interest 2: Solvents
- Area of Interest 3: Solid Sorbents

Oxy-combustion

- Area of Interest 4: Oxy-combustion System Development
- Area of Interest 5: Flue Gas Purification
- Area of Interest 6: Oxy-combustion Boiler Development

Chemical Looping

- Area of Interest 7: Chemical Looping Combustion

A description of what is required for applications submitted in each of the Areas of Interest under the subject announcement is provided below.

AREAS OF INTEREST

Post-Combustion Capture

Area of Interest 1: Membranes – Membrane-based capture uses permeable or semi-permeable materials that allow for the selective transport/separation of CO₂ from flue gas. Key technical challenges to the use of membranes to capture CO₂ from coal-fired power plant flue gas include: (1) large flue gas volume; (2) relatively low CO₂ concentration (less than 15% by volume); (3) low flue gas pressure (i.e., driving force); (4) flue gas contaminants (e.g., SO₂, trace elements, uncollected flyash); and (5) the need for high membrane surface area. In responding to Area of Interest 1 applicants shall demonstrate a thorough understanding of the technology being proposed. The applicant shall describe the current level of performance of the proposed technology relative to both CO₂ capture removal efficiency and cost and the approach to be followed to meet DOE's performance goal. In particular, the applicant shall provide information relevant to overcoming the technical challenges identified above in achieving the DOE goal, with specific emphasis on:

- Describe the membrane transport mechanism
- Describe all auxiliary power required such as blowers, compressors, and/or pumps and all annual operating costs associated with the technology
- Membrane permeability and selectivity under realistic operating conditions
 - Describe performance effects as a function of operating conditions (pressure, temperature, flue gas composition)
 - Effects of aging
- Effect of flue gas contaminants and water on membrane performance

- Mechanical stability of the membrane
- Membrane costs (in $\$/\text{m}^2$)
- Membrane size (in $\text{m}^2/\text{ton CO}_2\text{captured}$)
- Description of the proposed module type of the membrane system, including but not limited to:
 - Expected membrane area packing density
 - Pressure drop at both sides of the membrane
 - Operating pressure of the membrane system

Area of Interest 2: Solvents – Solvent-based systems, typically using amines, are in commercial use in scrubbing CO_2 from industrial flue gases and process gases. However, they have not been applied to removing large volumes of CO_2 as would be encountered in a PC-fired utility boiler flue gas. Key technical challenges to solvent based systems for capturing CO_2 from coal-fired power plants include: (1) large flue gas volume; (2) relatively low CO_2 concentration; (3) flue gas contaminants; and (4) high parasitic power demand for solvent recovery. The liquid and gas are typically contacted in a counter-current packed column or a spray tower. Commercial CO_2 capture solvents are typically amine-based. In responding to Area of Interest 2 applicants shall demonstrate a thorough understanding of the technology being proposed. The applicant shall describe the current level of performance of the proposed technology relative to both CO_2 capture removal efficiency and cost and the path forward to achieving DOE's performance goal. The applicant shall provide information relevant to overcoming the technical challenges identified above in achieving the DOE goal. The applicant shall also provide the following specific information, as applicable, about their proposed solvent-based capture technology:

- Describe all auxiliary power required including refrigeration or solvent cooling for any flue gas, blowers to overcome pressure drop, pumps for solvent circulation, vacuum pumps, and all annual operating costs including all make-up chemical costs, replacement packing material, and water treatment chemicals
- Theoretical maximum capacity, actual working capacity in lab testing, and target working capacity (in $\text{lb CO}_2/\text{lb solution}$) including approaches to reach the target
- Total capture process steam requirement (in $\text{Btu} / \text{lb CO}_2$ captured)
- Annual operating cost (in $\$/\text{ton CO}_2$ removed)
- Description of stripper configuration
- Chemical and thermal stability of the solvent, include the following if available:
 - Experimental data on the chemical stability of the solvent under realistic flue gas conditions
 - Experimental testing data of the thermal stability under regeneration conditions
 - Degradation pathways of the solvent, supported by experimental data if possible.
 - Corrosion testing data if available
 - Discussion of solvent toxicity
- Solvent make up rate due to degradation and solvent loss
- Chemical reactions for the CO_2 absorption/regeneration cycle
 - Include kinetic data (rate constant and activation energy) if available
 - Expected operating temperatures for absorption/stripping processes
 - If reaction is slow discuss the approaches to accelerate the reaction
 - Include literature and laboratory data for the heat of reaction for both the absorption/stripping reactions, if available
 - For mixed solvents, provide heat of absorption/stripping for each component in the range of CO_2 working capacity
 - Approaches to handle the heat of absorption in the absorption column
 - Theoretical regeneration energy, actual laboratory tested regeneration energy and target regeneration energy as a function of working capacity (per mass of CO_2 removed)
- Solvent composition and cost (if manufactured in large quantities)
- Solvent Physical Properties (if available)
 - Molecular weight or average molecular weight (mixed solvents)

- Boiling point of the solvent (or solvents if mixed solvents)
 - Solvent heat capacity (in pure or mixed form)
 - Other physical properties such as density and viscosity, surface tension of the solvent (in pure or mixed form).
- Experimental CO₂ absorption isotherms at different temperatures

Area of Interest 3: Solid Sorbents – Solid particles can be used to capture CO₂ from flue gas through chemical absorption, physical adsorption, or a combination of the two effects. Possible configurations for contacting the flue gas with the solid particles include fixed, moving, and fluidized beds. Key technical challenges to sorbent based systems for capturing CO₂ from coal-fired power plants include: (1) large flue gas volume; (2) relatively low CO₂ concentration; (3) flue gas contaminants; and (4) high parasitic power demand for sorbent recovery. Solid sorbents used for flue gas CO₂ capture must be capable of having high CO₂ loading capacities while being able to maintain particle performance in the presence of flue gas contaminants. The following information must be specifically addressed in applications submitted to the post-combustion sorbents area of interest:

- Describe all auxiliary power required including refrigeration or sorbent cooling for any flue gas, blowers to overcome pressure drop, compressors for sorbent circulation, vacuum pumps, and all annual operating costs include all make-up chemical costs, replacement packing material, and water treatment chemicals.
- Description of the proposed configuration for contacting the flue gas with the sorbent
 - For fixed-beds, include bed type and expected regeneration time
- CO₂ working capacity (in mol CO₂/kg sorbent) defined as the difference between the “loaded sorbent” at breakthrough and the sorbent after regeneration. This is measured at steady-state when cycling between CO₂ absorption and CO₂ regeneration. Include the following working capacity information:
 - Theoretical maximum capacity
 - Actual working capacity in lab testing
 - Targeted CO₂ working capacity and approaches to reach the target
 - Adsorption capacity after repeated adsorption/desorption cycles
 - Effect of flue gas contaminants
- Chemical reactions for the CO₂ adsorption/regeneration cycle
 - Both literature and laboratory data of the heats of adsorption for adsorption/desorption reactions
 - Breakthrough curves at different adsorption/desorption conditions, including the expected desorption conditions (temperature/pressure)
 - If heat of absorption changes, then provide the data with its working capacity range
 - Theoretical regeneration energy, actual laboratory tested regeneration energy and target regeneration energy as a function of working capacity (per mass of CO₂ removed)
 - How to deal with water vapor if it is involved in the adsorption reaction
- Total capture process steam requirement (in Btu / lb CO₂ captured)
- Sorbent cost (in \$/kg sorbent) if manufactured in large quantities
- Annual operating cost (in \$/ton CO₂ removed)
- Heat management in the absorption and regeneration steps
- Sorbent attrition or blinding, how to deal with fines
- Sorbent physical and chemical properties:
 - Sorbent particle size, surface area, active component concentration, and other key characteristics
 - Shape of the sorbent
 - Density of the sorbent
 - Experimental data on mechanical strength. If weak, alternatives to overcome the weak mechanical strength
- CO₂ adsorption isotherms of the sorbent at different temperatures

Oxy-combustion

Area of Interest 4: Oxy-combustion System Development – While the key technical components of oxy-combustion systems are commercially available, an integrated commercially operated oxy-combustion power plant has yet to be demonstrated. To support the development of this technology several technical hurdles exist. Research is required to optimize oxy-combustion burners so that flue gas recirculation is minimized and boiler efficiency is maximized. Corrosion characteristics of existing boiler materials under conditions created due to flue gas recycle need to be determined. Also, research is required to fully assess the amount of air infiltration expected on retrofit applications, while developing methodologies for the reduction of air infiltration. Applications may be submitted to this overall area of interest or the subtopics listed below. For the Oxy-combustion System Development area of interest, the applicant shall provide information relevant to overcoming the technical challenges identified above in achieving the DOE's 90% CO₂ capture goal at less than a 20% increase in the cost of electricity. The applicant shall also provide the following specific information, as applicable, about their proposed oxy-combustion system development:

- Air in-leakage effects on process efficiency
- Effects of flue gas contaminant recycle on corrosion in existing coal-fired power plants
- Description of the overall oxy-combustion system proposed (including air separation, oxy-combustion boiler, post combustion clean-up, CO₂ compression and purification, etc.)

The oxy-combustion topic area has two additional related areas of interest as follows: Flue gas purification and Oxy-combustion boiler development. Technologies developed in these areas of interest will be utilized to help achieve the program goals of 90% CO₂ capture at less than 20%

increase in cost of electricity. However, applicants under these areas of interest do not have to propose an integrated oxy-combustion system.

Area of Interest 5: Flue Gas Purification – Oxy-combustion systems produce a flue gas that has a high CO₂ concentration but may also includes water, excess O₂, N₂, SO_x, NO_x, Hg, and other contaminants. Depending on transportation and sequestration requirements, the levels of these compounds present in the flue gas may need to be reduced to acceptable levels. The following information must be specifically addressed in applications submitted to the oxy-combustion area of interest pertaining to flue gas purification for oxy-combustion systems:

- Final disposition of sulfur oxides, nitric oxides, mercury, etc. in the overall process
- Describe all auxiliary power required including refrigeration or cooling for any flue gas, blowers to overcome pressure drop, compressors for circulation, vacuum pumps, and all annual operating costs include all make-up chemical costs, replacement packing material, and water treatment chemicals. (kWh/ ton CO₂)
- Describe the purification process including block flow diagrams and separation mechanisms

Area of Interest 6: Oxy-combustion Boiler Development – The characteristics of oxy-combustion as compared to air fired combustion have not yet been fully developed. Applications addressing laboratory and bench scale research into oxy-combustion boiler characteristics and innovative oxy-burner design are of interest. Oxy-combustion flame characteristics, burner and coal feed design, and analyses of the interaction of oxy-combustion products with boiler materials are all areas of research sought for coal based combustion systems. The following information must be specifically addressed in applications submitted to the oxy-combustion area of interest pertaining to oxy-combustion boiler development, where applicable:

- Describe the theoretical differences expected as far as the interaction of oxy-combustion products with boiler materials and the testing to be performed to evaluate the interaction with traditional boiler materials along with the effects on slag and ash

- If alternate materials are to be tested, discuss the reasoning for testing the material and any implications to boiler cost, availability, and any other identifiable materials risks
- Describe the oxy-combustion burner and coal feed and how they will be designed to take advantage of oxy-combustion conditions
- Describe any computational methods or models to be improved upon or developed for oxy-combustion systems

Chemical Looping

Area of Interest 7: Chemical Looping Combustion – Chemical looping involves the use of a solid O₂ carrier particle in the combustion of fuels. The O₂ carrier particle is oxidized in one reactor and is used to combust the fuel in another reactor. This funding opportunity announcement is interested in developing systems and O₂ carriers for use in chemical looping combustion of coal. Key issues for chemical looping combustion of coal include solids handling along with O₂ carrier capacity, reactivity, and chemical and/or physical attrition resistance. Applications to this area of interest should focus on laboratory research and development of coal-based chemical looping combustion systems through experimental development of oxygen carriers and systems for the interaction and separation of the various solid particles. Applications focused on conceptual studies are **not** allowed. Since applications to this area of interest may focus on experimental development of carrier particles and solids handling, applicants will not have to demonstrate the ability of the process to achieve program goals in their application. The following information must be specifically addressed in applications submitted to the chemical looping combustion area of interest:

- O₂ capacity (mol O₂/kg carrier)
- O₂ carrier cost (\$/kg carrier)
- System for dealing with the separation of coal char and ash from O₂ carrier particles
- Effect of contaminants in the solid fuel or as flue gas contaminants on O₂ carrier performance and attrition rate
- System response to O₂ carrier attrition or blinding
- Rates of oxidation and reduction reactions

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

- DOE anticipates awarding cooperative agreements under this program announcement (See Section VI.B.2 Statement of Substantial Involvement)

B. ESTIMATED FUNDING

- Approximately \$30,000,000 in DOE funding is expected to be available for new awards under this announcement.

C. MAXIMUM AND MINIMUM AWARD SIZE

- Ceiling (i.e., the maximum amount for an individual award made under this announcement): \$5,000,000 DOE share plus a minimum of 20% Cost Share. (See Part III, Section B for additional Cost Share information.)
- Floor (i.e., the minimum amount for an individual award made under this announcement): None

D. EXPECTED NUMBER OF AWARDS

- DOE anticipates making 5 - 15 awards under this announcement depending on the size of the awards.

E. ANTICIPATED AWARD SIZE

- While the maximum award size (i.e., the ceiling) is \$5,000,000, DOE anticipates that awards will be in the \$500,000 – \$5,000,000 range (DOE Share) for the total project period.

F. PERIOD OF PERFORMANCE

- DOE anticipates making awards for up to 36 months. For multiple-year projects, the Applicant shall propose the effort in distinct twelve month budget periods with separate budgets, logical end-points and final deliverables for each budget period. (Please reference the discussion on “Deliverables” in Part IV, Section C, “Content and Form of Application” for additional information). Continuation into a subsequent budget period Will be contingent upon satisfactory performance of the previous budget period, programmatic goals and availability of funds.

G. TYPE OF APPLICATION

- DOE will accept new applications under this announcement.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE APPLICANTS

- All types of entities are eligible to apply, except other Federal agencies, Federally Funded Research and Development Center (FFRDC) Contractors, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

B. COST SHARING

- The cost share must be at least 20% of the total allowable costs for research and development projects (i.e., the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law. (See 10 CFR part 600 for the applicable cost sharing requirements.)

C. OTHER ELIGIBILITY REQUIREMENTS

- **Federally Funded Research and Development Center (FFRDC) Contractors.**

FFRDC contractors are not eligible for an award under this announcement, but they may be proposed as a team member on another entity's application subject to the following guidelines:

Authorization for non-DOE/NNSA FFRDCs. The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award and must not place the FFRDC contractor in direct competition with the private sector.

Authorization for DOE/NNSA FFRDCs. The cognizant contracting officer for the FFRDC must authorize in writing the use of a DOE/NNSA FFRDC contractor on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization.

"Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector."

Value/Funding. The value of, and funding for, the FFRDC contractor portion of the work will not normally be included in the award to a successful applicant. Usually, DOE/NNSA will fund a DOE/NNSA FFRDC contractor through the DOE field work proposal system and other FFRDC contractors through an interagency agreement with the sponsoring agency.

Cost Share. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

FFRDC Contractor Effort:

- The FFRDC contractor effort, in aggregate, shall not exceed 25% of the total estimated cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

Responsibility. The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC contractor.

- **Performance of Work in the United States (See Section IV.G)**

The Recipient agrees that at least 75% of the direct labor cost for the project (including subcontractor labor) shall be incurred in the United States, unless the Recipient can demonstrate to the satisfaction of the Department of Energy that the United States economic interest will be better served through a greater percentage of the work being performed outside the United States.

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

- Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select “Apply for Grants,” and then select “Download Application Package.” Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent.

- Letters of Intent are not required.

2. Pre-application

- Pre-applications are not required.

C. CONTENT AND FORM OF APPLICATION – 424 (R&R)

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below. Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.

1. **SF 424 (R&R)** Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (Icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 18 can be found on the DOE Financial Assistance Forms Page at http://management.energy.gov/business_doe/business_forms.htm under Certification and Assurances.
2. **RESEARCH AND RELATED Other Project Information**
Complete questions 1 through 5 and attach files. The files must comply with the following instructions:

Project Summary/Abstract (Field 6 on the Form)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public. The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. To attach a Project Summary/Abstract, click “Add Attachment.”

Project Narrative (Field 7 on the Form)

The project narrative must not exceed thirty (30) pages, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right). **EVALUATORS**

WILL ONLY REVIEW THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application, because the information contained in these sites will not be reviewed. See Part VIII.D for instructions on how to mark proprietary application information. To attach a Project Narrative, click “Add Attachment.”

The project narrative must include:

- Project Objectives: This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.
- Merit Review Criterion Discussion: The section should be formatted to address each of the merit review criterion and sub-criterion listed in Part V.A. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. The narrative should be sufficiently descriptive when referencing other documents that are not submitted in this application. **DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERION AND SUB-CRITERION.**
- Relevance and Outcomes/Impacts: This section should explain the relevance of the effort to the objectives in the program announcement and the expected outcomes and/or impacts.
- Roles of Participants: For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.
- Facilities And Other Resources: Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed and, if appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project such as machine and electronics shops.
- Equipment: List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.
- Bibliography And References, If Applicable: Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.
- Statement Of Project Objectives (SOPQ):
The Department of Energy's, National Energy Technology Laboratory uses a specific format for Statement of Project Objectives in its awards. In announcements such as this one, where the Government does not provide a Statement of Project Objectives, the Applicant is to provide one, which the DOE will then use to generate the Statement of Project Objectives to be included in the award.

The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. The Statement of Project Objectives may be released to the public by DOE in whole or in part at any time. It is therefore required that it shall not contain proprietary or confidential business information.

The Statement of Project Objectives is generally less than 10 pages in total for the proposed work. Applicants shall prepare the Statement of Project Objectives in the following format:

TITLE OF WORK TO BE PERFORMED

(Insert the title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project, as appropriate. This section provides a brief summary of the planned approach to this project. An outline of the Project Management Plan (referenced in Task 1.0 below and required to be submitted with your application) is provided later in this Part.

PHASE I (Budget Period 1)

Task 1.0 – Project Management and Planning

(Description includes work elements required to revise and maintain the Project Management Plan and to manage and report on activities in accordance with the plan)

Subtask 1.1
(Description)

Task 2.0 - (Title)

Subtask 2.1
(Description)

PHASE II (Budget Period 2 – if applicable and approved for continuation)

Task 3.0 - (Title)

PHASE III (Budget Period 3 – if applicable and approved for continuation)

D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist. See the NETL Business Page at <http://www.netl.doe.gov/business/forms/FederalAssistanceReportingChecklistExample.pdf> for the proposed Checklist for this program.

PLEASE NOTE: In addition to the standard reports identified on the "Federal Assistance Reporting Checklist", this Funding Opportunity Announcement requires that a Topical Report be submitted at the completion of each budget period.

The Recipient shall also provide a list of any other deliverables specific to this project. These reports shall be identified within the text of the Statement of Project Objectives. See the following examples:

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)
3. Topical Report for Budget Period 1

E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

The Recipient shall prepare detailed briefings for presentation to the Project Officer at the Project Officer's facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Recipient at least once per year to explain the plans, progress, and results of the technical effort.

The Recipient shall provide and present a technical paper(s) at the DOE/NETL Annual Contractor's Review Meeting to be held at the NETL facility located in Pittsburgh, PA or Morgantown, WV.

- Project Performance Site:
Indicate the primary site where the work will be performed. If a portion of the work will be performed at any other sites, identify those sites, also.
- Biographical Sketch Appendix:
Provide a biographical sketch for the project director/principal investigator (PD/PI) and each senior/key person listed in Section A on the R&R Budget form. Provide the biographical sketch information as an appendix to your project narrative. Do not attach a separate file. The biographical sketch appendix will not count in the project narrative page limitation. The biographical information for each person must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

Education and Training:

Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree, and year.

Research and Professional Experience:

Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

Publications:

Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address if available electronically.

Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities: List no more than 5 professional and scholarly activities related to the effort proposed.

- **Bibliography & References Cited Appendix:**
Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. Do not attach a file in field 8. This appendix will not count in the project narrative page limitation.
- **Facilities & Other Resources Appendix:**
This information is used to assess the capability of the organizational resources, including subawardee resources, available to perform the effort proposed. Identify the facilities to be used (Laboratory, Animal, Computer, Office, Clinical, and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. Do not attach a file in field 9. This appendix will not count in the project narrative page limitation.
- **Equipment Appendix:**
List major items of equipment already available for this project and, if appropriate identify location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. Do not attach a file in field 10. This appendix will not count in the project narrative page limitation.

Other Attachments (Field 11 on the form):

If you need to elaborate on your responses to questions 1-5 on the “Other Project Information” document, attach a file in field 11.

Also, attach the following files:

Project Management Plan.

This plan should be formatted to include the following sections with each section to include the information as described below:

- A. Executive Summary: Provide a description of the project that includes the objective, project goals, and expected results. For purposes of the application, this information is included in the Project Narrative (Field 7) and should be simply copied to this document for completeness, so that the Project Management Plan is a stand-alone document.
- B. Risk Management: Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. As a minimum, include the initial identification of significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.
- C. Milestone Log: Provide milestones for each budget period (or phase) of the project. Each milestone should include a title and planned completion date. Milestones should be quantitative and show progress toward budget period and/or project goals.
- [Note: During project performance, the Recipient will report the Milestone Status as part of the required quarterly Progress Report as prescribed under Attachment 4, Reporting Requirements Checklist. The Milestone Status will present actual performance in comparison with Milestone Log, and include:
- (1) the **actual** status and progress of the project,
 - (2) specific progress made toward achieving the project’s milestones, and,
 - (3) any proposed changes in the project’s schedule required to complete milestones.]
- D. Funding and Costing Profile: Provide a table (the Project Funding Profile) that shows, by budget period, the amount of government funding going to each project team member. Also, provide a table (the Project Costing Profile) that projects, by month, the expenditure of government funds for the first budget period, at a minimum.
- E. Project Timeline: Provide a timeline of the project (similar to a Gantt chart) broken down by each task and subtask, as described in the Statement of Project Objectives. The timeline should include for each task, a start date, and end date. The timeline should show interdependencies between tasks and include the milestones that are identified in the Milestone Log (Section C).
- F. Success Criteria at Decision Points: Provide success criteria for each decision point in the project, including go/no-go decision points and the conclusions of budget periods and the entire project. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

[Note: As the first task in the Statement of Project Objectives, successful applicants will revise the version of the Project Management Plan that is submitted with their applications by including details from the negotiation process. This Project Management Plan will be updated by the Recipient as the project progresses, and the Recipient must use this plan to report schedule and budget variances.]

Save this plan in a single file named “pmp.pdf” and click on “Add Attachments” in Field 11 to attach.

Commitment Letters from Third Parties Contributing to Cost Sharing

If a third party, (i.e., a party other than the organization submitting the application) proposes to provide all or part of the required cost sharing, the applicant must include a letter from the third party stating that it is committed to providing a specific minimum dollar amount of cost sharing. The letter should also identify the proposed cost sharing (e.g., cash, services, and/or property) to be contributed. Letters must be signed by the person authorized to commit the expenditure of funds by the entity and be provided in a PDF format. Save this information in a single file named “CLTP.pdf” and click on “Add Attachments” in Field 11 to attach.

Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Contractor, if applicable.

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This order and the DOE Field Work Proposal form are available at http://management.energy.gov/business_doe/business_forms.htm. Use the FFRDC name as the file name (up to 10 letters) and attach to the R&R Other Project Information form in Field 11 – Add Attachments.

3. RESEARCH AND RELATED BUDGET (TOTAL FED + NON-FED)

Complete the Research and Related Budget (Total Fed & Non-Fed) form in accordance with the instructions on the form (Activate Help Mode to see instructions) and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV. G).

Budget Justification (Field K on the form).

Provide the required supporting information for the following costs (See R&R instructions): equipment; domestic and foreign travel; participant/trainees; material and supplies; publication; consultant services; ADP/computer services; subaward/consortium/contractual; equipment or facility rental/user fees; alterations and renovations; and indirect cost type. Provide any other information you wish to submit to justify your budget request. If cost sharing is required, provide an explanation of the source, nature, amount, and availability of any proposed cost sharing. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year.

4. R&R SUBAWARD (Total Fed + Non-Fed) FORM

Budgets for Subawardees, other than DOE FFRDC Contractors. You must provide a separate

cumulative R&R budget for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET (Total Fed + Non-Fed) FORM and e-mail it to each subawardee that is required to submit a separate budget. After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name as the file name.

5. Disclosure of Lobbying Activities (SF-LLL)

If applicable, complete SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

SUMMARY OF REQUIRED FORMS/FILES

Your application must include the forms from the application package and other documents as shown below:

Name of Document	Format	Attach to
SF 424 (R&R)	Form	N/A
RESEARCH AND RELATED Other Project Information	Form	N/A
Project Summary/Abstract	PDF	Field 6
Project Narrative, including required appendices	PDF	Field 7
Budget for DOE/NNSA FFRDC, if applicable	PDF	Field 11
Project Management Plan	PDF	Field 11
Commitment Letters from Third Parties	PDF	Field 11
RESEARCH AND RELATED BUDGET (Total Fed + Non-Fed)	Form	N/A
Budget Justification	PDF	Field K
R&R SUBAWARD BUDGET (Total Fed + Non-Fed) ATTACHMENT(S) FORM , if applicable	Form	N/A
SF-LLL Disclosure of Lobbying Activities , if applicable	Form	N/A

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE/NNSA reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Environmental Questionnaire

E. SUBMISSION DATES AND TIMES

1. Pre-application Due Date

- Pre-applications are not required.

2. Application Due Date

- Applications should be received by March 4, 2008, not later than 8:00 PM Eastern Time. You are encouraged to transmit your application well before the deadline. APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

F. INTERGOVERNMENTAL REVIEW

- This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS

Cost Principles Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

Performance of Work In United States

The Recipient agrees that at least seventy-five (75%) of the direct labor cost for the project (including subcontractor labor) shall be incurred in the United States, unless the Recipient can demonstrate to the satisfaction of the Department of Energy that the United States economic interest will be better served through a greater percentage of the work being performed outside the United States.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

- **APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD.** Submit electronic applications through the “Apply for Grants” function at www.Grants.gov. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

2. Registration Process

- You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See www.grants.gov/GetStarted). **We recommend that you start this process at least three weeks before the application due date.** It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. **IMPORTANT:** During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called “Marketing Partner identification Number” (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of five e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. When the AOR receives email Number 5, it is their responsibility to follow the instructions in the email to logon to IIPS and verify that their application was received by DOE. You will need the Submission Receipt Number (email Number 1) to track a submission. The titles of the five e-mails are:

Number 1 - Grants.gov Submission Receipt Number
Number 2 - Grants.gov Submission Validation Receipt for Application Number
Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number
Number 5 – DOE e-Center Grant Application Received

The last email will contain instructions for the AOR to register with the DOE e-Center. If the AOR is already registered with the DOE e-Center, the title of the last email changes to:

Number 5 – DOE e-Center Grant Application Received and Matched

This email will contain the direct link to the application in IIPS. The AOR will need to enter their DOE e-Center user id and password to access the application.

Part V - APPLICATION REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

- Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement.

2. Merit Review Criteria

Scientific and Technical Merit (50%)

- (a) Degree to which the proposed technology or methodology represents an important advancement toward achieving the "Funding Opportunity Announcement Objectives" in the targeted Area of Interest.
- (b) The degree to which the proposed work identifies and/or makes progress on new concepts, thereby increasing the likelihood of a new successful technology.
- (c) Feasibility of the proposed concept; the degree to which the proposed work is based on sound scientific and engineering principles.
- (d) Awareness of competing commercial and emerging technologies and how the proposed concept/technology provides significant improvement.
- (e) Explanation of the potential market segment within the electric power sector that could adopt their technology.
- (f) Adequacy of the discussion of specific area of interest information requests when compared to the technology's current level of development.
- (g) Degree to which the applicant has considered all aspects required to design their technology to an existing or future electric power generation plant.
- (h) Adequacy of the discussion of the technical and process risks associated with the proposed technology.

Technical Approach and Understanding (30%)

- (a) Adequacy and feasibility of the applicant's technical approach, work plan, and risk assessment and management plan.
- (b) Appropriateness, rationale, and completeness of the proposed SOPO.
- (c) Reasonableness of the proposed project schedule, staffing plan and planned travel.

Applicant/Team Capabilities, Organization and Facilities (20%)

- (a) Appropriateness and extent of key personnel credentials, capabilities, and experience.
- (b) Demonstrated experience of the applicant and participating organizations in the technology areas addressed in the application and in managing similar projects.

(c) Clarity, logic and likely effectiveness of the project organization, including subcontractors; the roles and responsibilities of each partner for each task and the availability of key personnel to complete the proposed project.

(d) The adequacy (quality, availability, and appropriateness) of the facilities and equipment to perform project tasks.

1. Other Selection Factors

- The selection official will consider the following program policy factors in the selection process:
 1. It is desirable to select for award a group of projects which represents a diversity of technical approaches and methods;
 2. It is desirable to support complementary and/or duplicative efforts or projects, which, when taken together, will best achieve the research goals and objectives;
 3. It is desirable that different kinds and sizes of organizations be selected for award in order to provide a balanced programmatic effort and a variety of different technical perspectives;
 4. It is desirable, because of the nature of the energy source, the type of projects envisioned, or limitations of past efforts, to select for award a group of projects with a broad or specific geographic distribution.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

- Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance and Unsolicited Proposals." This guide is available under Financial Assistance, Regulations and Guidance at <http://www.management.energy.gov/documents/meritrev.pdf>.

2. Selection

- The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award

- The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

- DOE anticipates notifying applicants selected for award by the end of July 2008 and making awards by the end of September 2008.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

- DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Part IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

- A Notice of Financial Assistance Award issued by the contracting officer is the authorizing award document. It normally includes either as an attachment or by reference: (1). Special Terms and Conditions; (2). Applicable program regulations, if any; (3). Application as approved by DOE/NNSA.; (4). DOE assistance regulations at 10 CFR part 600, or, for Federal Demonstration Partnership (FDP) institutions, the FDP terms and conditions; (5). National Policy Assurances To Be Incorporated As Award Terms; (6). Budget Summary; and (7). Federal Assistance Reporting Checklist, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR part 600 (See: <http://ecfr.gpoaccess.gov>), except for grants and cooperative agreements made to Federal Demonstration Partnership (FDP) institutions. The FDP terms and conditions and DOE FDP agency specific terms and conditions are located on the National Science Foundation web site at http://www.nsf.gov/awards/managing/fed_dem_part.jsp.

2. Special Terms and Conditions and National Policy Requirements

Special Terms and Conditions and National Policy Requirements

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm.

The National Policy Assurances To Be Incorporated As Award Terms are located at DOE http://management.energy.gov/business_doe/business_forms.htm.

Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/financial_assistance_awards.htm.

Statement of Substantial Involvement

There will be substantial involvement between the DOE and the Recipient during performance of this Cooperative Agreement. The DOE and Recipient will collaborate and share responsibility for the management of the project as further described in this section.

RECIPIENT'S RESPONSIBILITIES. The Recipient is responsible for:

Performing the activities supported by this award in accordance with the Project Management Plan, including providing the required personnel, facilities, equipment, supplies and services;

Managing and controlling project activities in accordance with established processes and procedures to ensure tasks and subtasks are completed within schedule and budget constraints defined by the current Project Management Plan;

Implementing an approach to identify, analyze, and respond to project risks that is commensurate with the complexity of the project;

Defining and revising approaches and plans, submitting the plans to DOE for review, and incorporating DOE comments;

Coordinating related project activities with external suppliers, including DOE M&O contractors, to ensure effective integration of all work elements;

Attending annual program review meetings and reporting project status;

Submitting technical reports and incorporating DOE comments; and

Presenting the project results at appropriate technical conferences or meetings as directed by the DOE Project Officer (number of conferences/meetings will not exceed eight (8)).

DOE RESPONSIBILITIES. DOE is responsible for:

Reviewing in a timely manner project plans, including project management, testing and technology transfer plans, and recommending alternate approaches, if the plans do not address critical programmatic issues;

Participating in project management planning activities, including risk analysis, to ensure DOE's program requirements or limitations are considered in performance of the work elements;

Conducting annual program review meetings to ensure adequate progress and that the work accomplishes the program and project objectives. Recommending alternate approaches or shifting work emphasis, if needed;

Integrating and redirecting the work effort to ensure that project results address critical system and programmatic goals established by DOE FE, in coordination with the DOE Carbon Sequestration Program;

Promoting and facilitating technology transfer activities, including disseminating program results through presentations and publications; and

Serving as scientific/technical liaison between awardees and other program or industry staff.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. See the NETL Business Page at <http://www.netl.doe.gov/business/forms/FederalAssistanceReportingChecklistExample.pdf> for the proposed Checklist for this program.

PLEASE NOTE: In addition to the standard reports identified on the “Federal Assistance Reporting Checklist”, this Funding Opportunity Announcement requires that a Topical Report be submitted at the completion of each budget period.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted through the “Submit Question” feature of the DOE Industry Interactive Procurement System (IIPS) at <http://e-center.doe.gov>. Locate the program announcement on IIPS and then click on the “Submit Question” button. Enter required information. You will receive an electronic notification that your question has been answered. DOE/NNSA will try to respond to a question within 3 business days, unless a similar question and answer have already been posted on the website.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE/NNSA cannot answer these questions.

B. AGENCY CONTACT

Name: Bonnie Dowdell
E-mail: bonnie.dowdell@netl.doe.gov
Telephone: 412-386-5879

PART VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on Grants.gov and the DOE Industry Interactive Procurement System (IIPS). You can receive an email when a modification or an announcement message is posted by joining the mailing list for this announcement through the link in IIPS. When you download the application at Grants.gov, you can also register to receive notifications of changes through Grants.gov.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

"The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation."

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See “Notice of Right to Request Patent Waiver” in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE’s own needs or to insure the commercialization of technology developed under a DOE agreement.

Special Protected Data Statutes. This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to five (5) years from the development of the information, of data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data – Programs Covered Under Special Protected Data Statutes (10 CFR 600 Appendix A to Subpart D), would apply to an award made under this announcement. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and will also identify data that will be recognized by the parties as protected data.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.